Entering The Internet

And Some Interesting Things To Do When You Get There

BY KEVIN M. SAVETZ

The Internet is a worldwide network of university, government, corporate, and private computers. Over a million machines are part of the Internet—no one knows exactly how many, because no one is in charge. This network is a cooperative, free, anarchistic entity. Internet users have hundreds of services at their disposal, including electronic mail, software downloading, databases to search, chat services, games, and bulletin boards on every imaginable topic.

Computers on the Internet communicate using a protocol called TCP/IP. A machine linked in this manner can exchange data with any other machine on the Internet.

The Internet's roots are in another network, the ARPANET, a group of United States military computers. The experimental ARPANET was developed in the late 1960s and 1970s by the Advanced Research Projects Agency, or ARPA. It was later divided into the ARPANET, designated specifically for research, and MILNET, for military use. Other computers were slowly added to the ARPANET, and other networks were folded in. Eventually, the ARPAnet as a distinct entity ceased to exist—and the Internet was born. Today, the Internet grows at a staggering rate, with an estimated four hundred networks connected to it. As the cost of network-accessing hardware falls, and universities and businesses provide net access to scores of people at a time, the people using Internet are the mass public in what is becoming our global village.

So, how do you get on the Internet? Probably your local bulletin board isn't part of the Internet; though it may have message systems and games and whatnot, it doesn't have "telnet" and "FTP" and other programs that allow you to get interesting information from computers elsewhere. Some commercial services like CompuServe and America Online let users send and receive electronic mail from the Internet, but lack file transfer capabilities.

In order to use the Internet, you need an account on a computer that is connected to it. You use your modem to dial into the service and access your account. Several companies provide accounts for a fee, charging either per-hour or a flat monthly rate. Some universities give accounts gratis to students and faculty. It's best to find a service that's accessible with a local phone call, to keep your phone bill manageable. Some services allow nationwide access through a data network such as Tymnet, but these networks carry an added hourly surcharge. Take the time to find a system that is nearby and within your budget.

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COMMERCIAL SERVICES: A SAMPLER

Dozens of commercial services nationwide provide Internet access for a price. Space does not permit listing them all; however, here are a few companies that provide Internet accounts in the Bay Area:

A2I Communications offers accounts with access to a UNIX shell, electronic mail, FTP, telnet, and Usenet news. A2I charges a flat fee of $20 a month, but offers discounts if bought in advance: $45 for three months or $72 for six months. There is no sign-up fee or connect-time charge. To access it, dial (408)293-9010 if your modem is v.32 or v.32 bis, or (408)293-9020 if not. Login as "guest."

CERFnet offers accounts to individuals and entire organizations with multiple users. Fees start at $20 a month and $3 hourly for off-peak calling, with a $50 one-time installation fee. Users can call in from the local area, or using a nationwide 800 number for an extra fee. For information, call (619)455-3900 or 1-800-876-2373.

The videotext service **DELPHI** just added Internet capability in January. The service, which already had a broad base of users, says it is the first nationwide service to provide full Internet access, including electronic mail, FTP and telnet. DELPHI has two membership plans: the "10/4" plan costs $10 per month and includes four hours of use; additional use is $4 per hour. The "20/20 Advantage" plan is $20 per month, includes twenty hours of use, and costs $1.80 per hour for additional time. Rates apply for access speeds up to 2400bps; 9600bps access is currently being tested in some locations. The Internet service option costs an extra $3 per month and allows users to transfer 10MB of data. DELPHI access during business hours via Sprintnet or Tymnet carries a surcharge.

Through a trial membership offer, anyone interested in trying to learn DELPHI and the Internet can receive five hours of access for free. To join, dial by modem, 1-800-365-4636. After connecting, press return. At the "Username:" prompt, enter JOINDELPHI and at the password prompt, type INTERNET. If you have questions, call 1-800-695-4005.

From Berkeley, **Holonet** features email, telnet, FTP, Usenet, and IRC, as well as other services. Holonet costs $6 per month plus $2 an hour (off-peak) or $4 an hour (prime time) plus network surcharges for those not using the Berkeley access number. Happily, the monthly fee goes toward the hourly charge. Holonet is available for $60 annually, a $12 savings over the month-to-month rate.

Although some online services charge extra for users of fast modems, Holonet charges based on how much you download—so those with fast modems can "browse" without feeling rushed. The data transfer charge is $1 per megabyte during off-peak hours; $2 per hour in prime time. Those who keep more than 100K online are charged an additional $1 per megabyte per month storage fee. Call (510)704-0160 (voice) or (510)704-1058 (modem).

Of the services listed here, **Netcom Online Communication Services** offers local-call access from the widest area, covering San Francisco, Santa Cruz, Los Angeles and San Diego. The service, which offers a UNIX shell, FTP, telnet, IRC, Usenet feeds and other services, costs $19.50 per month, plus a one-time signup fee of $15. For information, call (408)554-8649 (voice) or login as "guest" using one of the modem dialups: (310)842-8835, (408)241-9760, (408)459-9851, (415)328-9940, (510)426-6860, (510)865-9004, or (619)234-0524.

The Portal System, with dialups in Cupertino and Mountain View, charges a monthly fee of $19.95, with a signup charge of $19.95. An additional charge of $1 per megabyte per month is imposed on those storing large amounts of data.

To get information about Portal online, dial (408)725-0561 or (408)973-8091 and login as "new" or "help". If you prefer to talk to a human, call (408)973-9111. This service is also available nationally over SprintNet and Tymnet, at an additional cost from $2.50 to $10 an hour. Portal offers a UNIX shell as well as a menu-based interface (if UNIX scares you), FTP, telnet, IRC, Usenet feeds, and other services.

The Whole Earth 'Lectronic Link, or **WELL**, is one of the best-known Bay Area commercial computing services. It offers a UNIX shell, electronic mail, FTP, telnet, Usenet, and other services. The service costs $15 a month, plus $2 an hour. Long-distance usage through the CompuServe Packet Network costs an additional $4 per hour.

To sign up online, dial (415)332-6106 and login as "newuser". (Callers from out of the area may wish to use the Packet Network: call

1-800-848-8980 to find the nearest CPN number, then call that number and enter "WELL" at the prompt.) The WELL's voice information line is (415)332-4335.

If you are a college student or faculty member, check with your campus computer center to learn about the online facilities available to you. Many schools, including California State University and the University of California, offer free accounts to students and staff. The Free Software Foundation at Massachusetts Institute of Technology sometimes provides free UNIX accounts as well. However, the FSF is in the business of writing software, not handing out free computer accounts. It may take months to get an FSF account.

Computer accounts are not all alike. A vast assortment of machines—from tiny personal computers to huge mainframes—are on the net. Not every service provides access to the same functions. For instance, while many sites offer FTP, a program that allows you to download software from other computers, some sites do not, for security reasons or disk-space limitations.

Once you have an account on an Internet-linked computer, you use various programs as tools for communicating with people and services elsewhere. While this is not meant to be a complete Internet tutorial (whole books have been written for that) it is meant to get the Internet-novice going in the right direction.

ELECTRONIC MAIL

Electronic mail, or email, allows users to send messages from one computer to another in a manner of moments. Typically, a coast-to-coast email message can arrive at its destination in as little as one minute.

There are too many different electronic mail software packages to cover here, so ask around at your system for the details. Usually, an electronic mail "address" is in the form "user@computername.location". For instance, if your username (or login name) at the WELL is "fjones," you can receive email at "fjones@well.sf.ca.us."

TELNET

Telnet is a program that allows you to login to another computer to run software there. Typically, you login either to access a "shell" command environment or some other utility.

To telnet to a computer, you need to know its name. This can either be in words, like "steer.sdsu.edu" or as a numeric address, like "130.191.1.11". Some services require you to connect to a specific "port" on the remote computer. Type the port number, if there is one, after the Internet address. (For example, "telnet nri.reston.va.us 185".)

When you connect to the remote computer, you will usually be asked for a login name. This isn't the same as the login to the account you are telneting from—instead, you usually need to enter the name of the service you wish to access. For example, you might login as "bbs" if you know that a certain computer offers a public bulletin board service.

If your system has manual pages installed, type "man telnet" and "man ftp" for online documentation specific to your system.

ANONYMOUS FTP

Some systems provide a program called FTP, which stands for file transfer protocol. FTP allows you to copy files from a remote computer to your local host. Thousands of sites provide anonymous FTP service, allowing you to download everything from online books to satellite pictures of the weather to public-domain utilities and games for your personal computer. (Software for use on your home computer first needs to be FTPed to your local host, then downloaded to your PC using XMODEM, ZMODEM, Kermit, or some other system—a two-step process.)

FTP works similarly on most systems. To access a remote site, type "ftp" followed by the name of the computer. A good place to start is with "ftp wuarchive.wustl.edu". Wuarchive contains a vast selection of programs for UNIX, IBM, and Macintosh computers.

Once FTP connects to a remote site, you will be asked for a username. Type "anonymous" as a username and enter your electronic mail address for the password. This is done as courtesy to the system administrators, who need to know who is using their system. On some sites, "ftp" works as the anonymous username. The anonymous FTP system provides file access for people who don't actually have an account on a remote computer.

Note that not every site permits anonymous FTP access—don't try to access a system that hasn't been billed as a public FTP server.

If the site you are FTPing to allows anonymous access—and everything goes as planned—you should be greeted with a message like "Guest login OK." You then have a number of UNIX-like commands available to you—use these to change directories, list files, set the file type and download files to your local host. Standard commands include: "help"; "ls" to list the files in the current directory; "cd" to change the directory; "binary," which tells the computer that you expect to download binary files; "ascii," which tells the computer you will be downloading text files; "get <filename>" makes a copy of the remote file on your local host; "quit" ends the FTP session.

Usually, there is a directory called "pub" where public files are stored. Type "cd pub" then "ls" to list what's available. You may wind your way through several directory levels before finding what you're looking for. For instance, on wuarchive, anti-virus software lives in "mirrors/msdos/trojan-pro".

TO LEARN MORE

Books for beginning to advanced Internet users are available—they can provide detailed information from how-tos to detailed technical explanations of the net.

Check out *The Whole Internet* by Ed Krol (published by O'Reilly & Associates) and *Zen & the Art of Internet* by Brendan Kehoe. Both books are aimed at the first-time user, covering the basics of the Internet, and lead into more advanced topics.

Also available is *The Internet Companion, A Beginner's Guide To Global Networking* by Tracy LaQuey with Jeanne C. Ryer (Addison-Wesley Publishing). The *Companion* includes a detailed history of the Internet, a discussion on "netiquette" (network etiquette), and how to find resources on the net.

Early this year, McGraw-Hill will release *The Internet Guide for New Users*, by Daniel P. Dern. Along with the obligatory topics such as telnet, FTP, and Archie, the book suggests how to get an Internet account and teaches enough UNIX skills for survival on the net.

Once you have an account, several good texts are available by FTP. "The Internet Companion," a beginner's guide to the net, is available by FTP from "world.std.com" in directory "/OBS/The.Internet.Companion". While you're there, download "zen-1.0.txt.Z" from the directory "/obi/Internet/zen-1.0"—this is an old, free version of Kehoe's book *Zen and the Art of Internet.* (Files that end in .Z need to be uncompressed with the Unix "uncompress" command before reading.)

Users who are more interested in the technical bits of the Internet will want to read *The Hitchhiker's Guide to the Internet.* This document, also written by Ed Krol, explains how Internet addresses work and discusses issues such as trust and carrying capacity of the Internet. The "Guide," as well as other useful texts for new users, is available from "wuarchive.wustl.edu" (128.252.135.4) in directory "/mirrors/EFF/internet-info."

FURTHER ADVENTURES AND USEFUL INFO

There are a lot of useful things you can do with the Internet. People and organizations have set up servers offering the public everything from daily stock exchange updates to

nuclear test data.

Here is a sample collection of Internet-accessible sources of useful information about the weather, geography, space, food and agriculture, and research tools. Most of these services are accessed using either telnet or FTP on your local computer. Telnet puts you in an interactive shell with a program at a remote site, while FTP allows you to download information or pictures for viewing on your local machine.

Weather And Geography: What could be more useful than up-to-date weather information? The University of Michigan runs a public service, the Weather Underground, with enough information to put Willard Scott to shame. To access it, "telnet downwind.sprl.wmich.edu 3000" or "telnet 141.212.196.177 3000". The service prompts you for a three-letter city code (for example, EKA for Eureka, California) then speedily delivers a daily forecast for that area. (Rain, and lots of it!) It contains weather information for the United States, Canada, and some international cities.

The Weather Underground also provides climate data for any United States or Canadian city, including 24-hour rainfall, total and average rainfall for the season, and record high and low temperatures. Here, too, you can search for information by the three-letter city code. Long-term forecasts, earthquake reports, hurricane advisories and marine forecasts are also available.

Not to leave well enough alone, the University of Michigan also offers a geographic server. Just "telnet martini.eecs.umich.edu 3000" or "141.212.99.9 3000", and enter the name of a city or its ZIP code. You'll find out the city's name, population, latitude and longitude, elevation, location, etc.

A short listing of recent earthquakes, date and time, including magnitude, location, and depth, is available with the command "finger quake@geophys.washington.edu" (or "finger quake@128.95.16.50").

An auroral activity monitor is another service accessed using "finger" command. Use "finger aurora@xi.uleth.ca" or "finger aurora@142.66.3.29" for information about auroral sightings, warnings, and watches.

Some of us would rather look at the weather. If your computer can display GIF-format pictures, you can view striking up-to-date weather pictures. FTP to vmd.cso.uiuc.edu (128.174.5.98), login as "anonymous," change the directory to "wx" and use binary mode. You can then download satellite images of the earth and her weather. Visible and infrared images from the GEOS-7 satellite over the US and Mexico are available for the downloading, and are updated frequently. Surface analysis maps are also available.

The "wx" directory also contains useful documents, including "spotfreq.doc", listing amateur radio frequencies with weather information, and "chase-tv.doc" which lists television stations that provide useful information for storm chasers. Additionally, "wx-talk.doc" gives information about weather-related mailing lists on the Internet.

GEOS images over North and Central America are also available by anonymous FTP from ats.orst.edu (128.193.120.19). Satellite GIFs of Europe from Meteosat are updated twice daily at cumulus.met.ed.ac.uk (129.215.168.19.)

For more information, a guide to weather images, data, and meteorological, oceanographic, and geophysical research data is available by sending electronic mail to pit-manager.mit.edu. Include "send usenet/news.answers/weather-data" in the body of the message. You will receive a file detailing where to find information on the internet, on CD-ROM, and in mailing lists. However, most of the sources mentioned in the text are aimed at the scientific community.

Space: NASA offers a "headline news" service, including daily press releases and updates on space shuttle missions. To read it,

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Join the Internet!

Portal, the Bay Area's premiere Internet services provider, gives you unparalleled access to the Internet. Excellent value, the highest possible quality, and top notch customer support make Portal your gateway to the Internet.

SLIP/PPP

The Bay Area's *only* low-cost slip/ppp service lets you connect your pc, mac or UNIX machine to the Internet. Take full advantage of the Net with services like mail, ftp, telnet, and irc.

UUCP

Use the Portal UUCP Connection™ to get full UUCP access. We'll provide mail forwarding, customized news feeds, a domain name, documentation, and everything else you need.

Shell

Portal Shell™ accounts let you use the power of the UNIX shell to access the Internet, as well as network email, The Portal Archive™, Usenet newsgroups, and extensive software libraries. Plus, the menu-based Portal Online™ gives you an easy-to-use interface.

PORTAL

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"finger nasanews@space.mit.edu".

NASA also operates an Internet-accessible bulletin board system, NASA SpaceLink. It offers information about shuttle launches, satellite updates, and NASA news. Use "telnet spacelink.msfc.nasa.gov" (or 192.149.89.61) to access it.

Images from the Magellan and Viking missions, among other things, are available from "ames.arc.nasa.gov" in the directory "space/cdrom". Again, you need to be able to display the GIF-format images after you download them.

Food: All this poking around the Internet is enough to make a person hungry. Fortunately, the net can help you there, too. Although they haven't perfected a server to bring you food, you can learn all about food and nutrition using PENpages.

PENpages is a database which contains thousands of reports, newsletters, and facts about agriculture and consumer-oriented nutrition information. In most cases, the actual text of the research and newsletters is online and available for your immediate perusal. For example, a search for "vegetarianism" revealed two dozen articles about or referring to vegetarianism. The software is quick, easy to use, and offers lots of online help.

To use PENpages, telnet "psupena.psu.edu" (or 128.118.36.4). When asked for a username, type "OH" (for Ohio.) The system is self-explanatory.

If you're more interested in cooking food than reading about it, FTP to "gatekeeper.dec.com". In the directory "pub/recipes" you'll find dozens of recipes, from tofu balls to pizza dough, and margaritas to meat loaf. Also check out "mthvax.cs.miami.edu" in directory "/recipes".

Libraries: The computer's ability to hold vast amounts of data—and search through it quickly—makes research that once took hours take only seconds. Another benefit is that you no longer need to be where the information is—going to the library to search through a card catalog is a thing of the past.

Bibliographic information about materials in the Library of Congress is available by telneting to 192.65.218.43 (dra.com.) Actually, it's only a subset of the complete Library of Congress holdings, but it's still quite vast and quite useful. (Searches for *MicroTimes*, Laurie Anderson, and rutabagas all provided more than enough information to start a research project in the right direction.) The program allows searches by title, author, subject, and other methods. The system provides quick searches and useful online help. The actual documents are not online, but once you have the call numbers of the materials you want, you can trot down to your local library to collect them.

MELVYL is the University of California online library system. It also serves California State University libraries. MELVYL holds over seven million unique book titles in all. In addition to access to the full MELVYL catalog and periodical listings, the system can connect you to ten other university libraries around the country.

Unfortunately, MELVYL does not provide Internet users all of the features accessible to UC students. For instance, indexes to recent journal articles are not available. To use MELVYL, telnet to 192.35.222.222 (melvyl.ucop.edu).

A plethora of reference information is on hand from INFO, the Rutgers University Pilot Campus-Wide Information System. Online materials include the Concise Oxford Dictionary, Oxford Thesaurus, two quotation references, the CIA world fact book, and various religious texts. Also online are hypertext electronic documents and other examples of the future of online retrieval. To use the service, telnet info.rutgers.edu (128.6.26.25) from the main menu, and select "library." The system also contains information probably useful only to those who attend Rutgers. Even though it is a "local" system for their use, the operators are kind enough to share their resources with the general public.

Also, check out CARL, at pac.carl.org (192.54.81.128). CARL provides access to two dozen other libraries' catalogs, as well. Unfortunately, a lot of the interesting information on CARL, like the online encyclopedia, isn't available to the general public.

Now, if you just want to look up a word, no problem. Ask Webster. Many systems have the Webster program all ready for you to use (type "webster" to see.) If not, a public Webster client will assist you. Type "telnet cs.indiana.edu 2627" (or 129.79.254.191 2627) to access the dictionary and spelling service.

Once you connect, the program won't prompt you for input. Type "SPELL" (be sure to use all capitals) followed by a word to verify the spelling of a word. If your word doesn't match anything in the dictionary, it will try to guess the correct spelling. The program also provides definitions to words: type "DEFINE" and your word to see the definitions. There are other commands as well, so type "HELP" to get a full set of instructions. Type "QUIT" to leave Webster.

For more information about finding catalogs online, download the file "library/internet.library" by FTP from ariel.unm.edu. This is a list of Internet-accessible catalogs and databases.

Misc.: Nuclear data is available by telneting to 130.199.112.132 (Username: nndc). To receive daily stock updates by electronic mail, send an email request to martin.wong@eng.sun.com. ■

Figure: Example FTP Session

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steer[3] ftp wuarchive.wustl.edu
Connected to wuarchive.wustl.edu.
220 wuarchive.wustl.edu FTP server (Fri Nov 20
  10:29:15 CST 1992) ready.
Name: anonymous
331 Guest login ok, send your complete e-mail
  address as password.
Password: waffle@steer.sdsu.edu
230-
230- This system may be used 24 hours a day,
  7 days a week. The local
230- time is Fri Jan 8 23:09:04 1993.
230-
230-Please read the file README
230- it was last modified on Mon Mar 2 08:29:25
  1992 - 311 days ago
230-Please read the file README.NFS
230- it was last modified on Thu Nov 12 12:50:58
  1992 - 56 days ago
230 Guest login ok, access restrictions apply.
ftp> binary
200 Type set to I.
ftp> cd /mirrors/EFF/internet-info
250 CWD command successful.
ftp> ls
200 PORT command successful.
150 Opening ASCII mode data connection for
  file list.
ptrs
interest-groups.txt.Z
usenet.qa.Z
usenet.newsgroups.Z
usenet.etiquette.Z
read.this.first.Z
privatized.nren.Z
lynch.Z
lita.nren.Z
internetworking.Z
internet.usenet.info.Z
internet.q.Z
internet.mailing.lists.Z
internet.libraries.Z
hitchhikers.guide.Z
gore.bill.Z
ftp.sites.Z
cisler.nren.Z
bitnet.info.Z
etiquette.Z
226 Transfer complete.
338 bytes received in .1 seconds (3.3 Kbytes/s)
ftp> get hitchhikers.guide.Z
200 PORT command successful.
150 Opening BINARY mode data connection for
  hitchhikers.guide.Z (23014 bytes).
226 Transfer complete.
local: hitchhikers.guide.Z remote:
  hitchhikers.guide.Z
23014 bytes received in 1.6 seconds (14 Kbytes/
  s)
ftp> quit
221 Goodbye.
steer[4] uncompress hitchhikers.guide.Z
steer[5] cat hitchhikers.guide
```